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☐ 1. Document ID: US 6184282 B1

L5: Entry 1 of 2

File: USPT

US-PAT-NO: 6184282

DOCUMENT-IDENTIFIER: US 6184282 B1

TITLE: Flameproof polyamide moulding compounds containing melamine cyanurate

DATE-ISSUED: February 6, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
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Gorrissen; Heiner	Ludwigshafen			DE
Ulmerich; Karlheinz	Carlsberg			DE
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US-CL-CURRENT: 524/493; 524/101, 524/413, 524/496, 524/514

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC
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☐ 2. Document ID: US 6043304 A

L5: Entry 2 of 2

File: USPT

US-PAT-NO: 6043304

DOCUMENT-IDENTIFIER: US 6043304 A

TITLE: Flame-retarded adhesive composition

DATE-ISSUED: March 28, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kehal; Narinder	Swindon			GB

US-CL-CURRENT: 524/115; 156/155, 524/121, 524/123, 524/127, 524/186, 524/195, 524/214, 524/216, 524/413

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC
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DB=USPT,PGPB,JPAB,EPAB,DWPI,TDBD; PLUR=YES; OP=ADJ

<u>L5</u>	melamine cyanurate near flame retardant and polymer [clm]	2	<u>L5</u>
<u>L4</u>	melamine cyanurate near flame retardant and polymer [ab]	1	<u>L4</u>
<u>L3</u>	melamine cyanurate near flame retardant and polymer [ti]	0	<u>L3</u>
<u>L2</u>	melamine cyanurate near flame retardant and polymer	17	<u>L2</u>
<u>L1</u>	melamine cyanurate near flame retardant	24	<u>L1</u>

END OF SEARCH HISTORY

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L5: Entry 1 of 2

File: USPT

DOCUMENT-IDENTIFIER: US 6184282 B1

TITLE: Flameproof polyamide moulding compounds containing melamine cyanurate

Brief Summary Text (52):

The novel thermoplastic molding compositions contain, as component B), from 1 to 40% by weight, preferably from 3 to 30% by weight, and in particular from 5 to 25% by weight, of melamine cyanurate as flame retardant.

CLAIMS:

D) from 0 to 30% by weight of other additives and processing aids where the total of the percentages by weight of components A) to D) is 100% selected from the group consisting of stabilizers and oxidation inhibitors, agents to counteract decomposition by heat and by ultraviolet light, lubricants, mold-release agents, dyes, pigments, plasticizers and impact modifying polymers.

WEST**End of Result Set**

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L5: Entry 2 of 2

File: USPT

DOCUMENT-IDENTIFIER: US 6043304 A

TITLE: Flame-retarded adhesive composition

Brief Summary Text (9):

As inventive alternatives to the phosphorus-containing additives, the flame-retardant additive may for example comprise zinc borate or melamine cyanurate. The invention may thus include (a) a hot melt adhesive composition comprising at least 10%, preferably 10 to 25%, more preferably 10 to 20%, especially preferably 10 to 15%, by weight of the whole composition, of melamine cyanurate as a flame-retardant additive, preferably in the absence of other flame-retardant additives; or (b) a hot melt adhesive composition comprising at least 10%, preferably 10 to 25%, more preferably 15 to 20%, by weight of the whole composition, of zinc borate as a flame-retardant additive, preferably in the absence of other flame-retardant additives. Compositions within these ranges, which are also preferably halogen-free, have also been found capable of passing the aforementioned "flaming drip" test requirements at the highest level of performance, V-0, according to UL94, while retaining desirable flow characteristics for application to and use with the aforementioned heat-recoverable articles.

CLAIMS:

5. A composition according to claim 1, wherein the base polymer has a Melt Flow Index, expressed in g/10 minutes, measured according to ASTM D138 (1979) at 190.degree. C. using a 2.16 kg weight, of at least 100.

COATED PAPER CONTAINING A PLASTIC SUPPORTING SUBSTRATE

BACKGROUND OF THE INVENTION

This invention relates generally to coated papers which, for example, are suitable for various printing processes, and more specifically the present invention is directed to never-tear plastic papers, that is for example papers containing a plastic supporting substrate rather than natural cellulose, with certain coatings thereover and the use of these papers in ink jet printing processes, dot matrix and impact printers, xerographic imaging and thermal transfer printing processes. Thus, in one embodiment, the present invention relates to never-tear papers comprised of a supporting substrate coated on one or both sides with a coating comprised of a polymer such as hydroxypropyl cellulose, which coating contains a pigment, or pigments, such as titanium dioxide, and a top toner or ink receiving layer, which papers can be selected for dry toner imaging and for wax-based ink donor films. The aforementioned top layer can be modified as indicated herein preferably to optimize the selection of the never-tear papers for use with dot matrix printers and typewriters, which modification can, for example, be preferably accomplished by the addition of fillers, such as colloidal silicas in effective amounts of from about 2 to about 20 weight percent. Additionally, in another embodiment of the present invention there are provided never-tear papers for ink jet printing, which papers contain thereover the coatings illustrated hereinafter with effective amounts of colloidal silica dispersed therein in, for example, an amount of from about 2 to about 60 percent by weight, and preferably in an amount of from about 25 to about 60 percent by weight. Accordingly, some of these coated papers of the present invention may also be incorporated into electrostatographic imaging processes, including color processes which employ liquid toners in some embodiments of the present invention.

In a patentability search report the following United States prior art patents were recited: U.S. Pat. No. 4,701,367 relating to coatings such as styrene-butadiene/styrene triblocks for typewriter ribbon transparencies, see the Abstract of the Disclosure for example; U.S. Pat. No. 4,711,816 relating to transparent sheet materials for plain paper electrostatic imaging apparatuses or copiers, which sheets contain an image receiving layer; U.S. Pat. No. 4,783,376, relating to transparencies with a coating layer of a certain electrical resistance; and U.S. Pat. No. 4,756,961 which discloses an ink accepting coating containing particles of silica, aluminum, silicate, zinc oxide, or titanium oxide.

There are disclosed in U.S. Pat. No. 3,759,744 and U.S. Pat. No. 4,268,595 methods for the preparation of electrographic recording papers for imaging. More specifically, electrographic recording papers can be prepared by applying a dielectric coating on a relatively conductive sheet. Various compounds, such as salts and other compounds capable of retaining or attracting moisture in the sheet may be incorporated into the paper to enhance the conductive properties. In some recording papers the conductive layer is applied on one side of the paper and the dielectric is applied to the other side. Also, the dielectric layer can be applied over the conductive layer. Other conventional recording papers comprise an electrically conductive layer and a dielectric layer thereon on one surface of a base paper

and an electrically conductive layer on the outer surface of the base paper. Materials selected as the dielectric layer include highly insulating resins such as silicone resins, epoxy resins, poly vinyl acetate resins, vinyl acetate resins, vinyl chloride resins and styrene-butadiene copolymers. These resins are generally dissolved in an organic solvent and coated on the base paper. It is usually necessary to provide an under-coat layer as a barrier coating on a base paper prior to the coating of a solution of an organic solvent type resin to prevent penetration of the solvent used into the paper. Examples of other electrographic papers are prepared by applying a dielectric film of plastic material such as polyethylene or polystyrene to the paper surface by melt extrusion. Also disclosed in U.S. Pat. Nos. 3,011,918; 3,264,137; 3,348,970 and 3,110,621 are papers for electrostatic recording employing aqueous coatings both for dielectric layer as well as the conductive layer. The materials of the conductive layer are water soluble or dispersable vinyl benzyl quaternary ammonium compounds and the dielectric layer can be comprised of carboxylated poly(vinyl acetate) in an aqueous ammoniacal solution.

There is also disclosed in U.S. Pat. No. 3,759,744 an electrostatic recording paper, which paper can be prepared by applying three successive aqueous coats to the machine glazed side of a paper web. The first coating contains titanium dioxide and an electroconductive water dispersible polymer of a vinyl benzyl quaternary ammonium compound. The second coating can be comprised of oxidized starch and calcium carbonate. The third coating may contain calcium carbonate and a carboxylated poly (vinyl acetate) in ammoniacal solution. The resulting web can then be dried between successive coatings and may be steam treated, see the Abstract of the Disclosure for example.

Further, there is disclosed in U.S. Pat. No. 4,268,595 an electrostatic recording material comprising a support having formed thereon a dielectric layer comprised of a terpolymer containing (a) methacrylic acid, (b) a monomer selected from the group consisting of (1) acrylic acid esters containing at least 4 carbon atoms and (2) methacrylic acid esters containing at least 5 carbon atoms, and (c) a monomer selected from the group consisting of (1) acrylic acid esters containing at least 4 carbon atoms and (2) methacrylic esters containing at least 5 carbon atoms, wherein monomer (b) and monomer (c) are different and at least one of the monomers (b) and (c) is an acrylic acid ester containing at least 11 carbon atoms or a methacrylic acid ester containing at least 8 carbon atoms, and a method for producing an electrostatic recording material, which comprises converting such as a terpolymer to a water soluble or water emulsifiable salt of the terpolymer in which about 20 to 100 mol percent of the carboxyl groups present form a salt with ammonia and/or a volatile amine, dissolving or dispersing the terpolymer salt in water, coating the resulting solution or dispersion onto a support, and drying the coating to volatilize the ammonia and/or volatile amine.

Also, there is illustrated in U.S. Pat. No. 4,397,883 an electrographic recording material comprising a conductive paper support coated with an electrically insulating layer comprising a blend of a vinyl ester interpolymer latex and up to 500 parts of an inert finely divided pigment per 100 parts by weight of latex interpolymer. The vinyl ester interpolymer which may comprise about 3 to about 7 weight percent of carboxylic acid groups can be

TABLE 1-continued

Example Nos. and Comparative Example Nos.			Ex. 1	Ex. 2	Ex. 3	Ex. 4	Comp. Ex. 1	Comp. Ex. 2	Comp. Ex. 3	Comp. Ex. 4	Comp. Ex. 5	Comp. Ex. 6
Properties	Maleic anhydride	C-3	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.72	0.40
	Rubbery polymer	E-1	10	10	10	10	10	10	10	0	10	10
	Peroxide	E-2										
		F-1									0.48	
		F-2										0.008
	Light discoloration	(ΔYI)	33	35	26	23	—	41	43	44	38	35
	Izod impact strength	(kg-cm/cm)	10	15	6	4	2	18	22	3	4	5
	Heat distortion	4.6 kg	148	162	120	110	—	173	190	205	140	142
	temperature ($^{\circ}\text{C}$.)	18.6 kg	118	118	106	100	—	117	115	95	103	106
	Average particle diameter	(μm)	1.4	1.6	2.1	2.3	cannot be measured	1.6	1.9	1.2	1.3	1.4
	Surface appearance		o	o	o	o	x	o	o	o	$\Delta - x$	Δ
	Whitening in a weatherometer test		o	o	o	o	—	Δ	x	x	—	—
	Small-thickness molding flow											
	0.3 mm thickness		2.1			2.7			1.0			
	0.7 mm thickness		1.6			2.3			1.0			
	1.0 mm thickness		1.3			1.7			1.0			
	3.2 mm thickness		1.1			1.3			1.0			
	Volume % of polyamide	(vol %)	47.5	47.5	47.4	47.4	47.4	47.5	47.6	74.7	47.5	47.5
	(B)/(C) weight ratio		60/40	70/30	30/70	20/80	0/100	80/20	100/0	100/0	40/60	40/60
	η sp/C of polystyrene	(dl/g)	0.82	0.83	0.80	0.76	0.79	0.80	—	—	0.60	0.68

TABLE 2

Example Nos. and Comparative Example Nos.			Ex. 5	Ex. 6	Ex. 7
Formulation (part by weight)	Polyamide	A-1	48	60	70
		A-2			
	Polyphenylene ether	B-1	25.2	18	12
		B-2			
	Polystyrene	C-1	16.8	12	8
		C-2			
Properties		C-3			
	Maleic anhydride	D-1	0.16	0.16	0.16
	Rubbery polymer	E-1	10	10	10
		E-2			
	Light discoloration	(ΔYI)	34	29	24
	Izod impact strength	(kg-cm/cm)	12	14	12
	Heat distortion	4.6 kg	148	155	170
	temperature ($^{\circ}\text{C}$.)	18.6 kg	121	110	104
	Average particle diameter	(μm)	1.4	1.3	1.4
	Surface appearance		o	o	o
	Volume % of polyamide	(vol %)	45.5	57.4	67.5
	(B)/(C) weight ratio		60/40	60/40	60/40
	η sp/C of polystyrene	(dl/g)	0.83	0.80	0.76

TABLE 3

Example Nos. and Comparative Example Nos.			Ex. 8	Ex. 9	Ex. 10	Comp. Ex. 7	Comp. Ex. 8	Comp. Ex. 9	Comp. Ex. 10	Comp. Ex. 11
Formulation (part by weight)	Polyamide	A-1								
		A-2	50	50	50	50	50	50	50	50
	Polyphenylene ether	B-1								
		B-2	20	20	20	20	20	20	20	20
	Polystyrene	C-1	20					20	10	
		C-2		20						
		C-3				20				

TABLE 3-continued

Example Nos. and Comparative Example Nos.			Ex. 8	Ex. 9	Ex. 10	Comp. Ex. 7	Comp. Ex. 8	Comp. Ex. 9	Comp. Ex. 10	Comp. Ex. 11
Properties		C-4			20					
		C-5					20			
	Maleic anhydride	D-1	0.16	0.16	0.16	0.16	0.16	0.01		
	Rubbery polymer	E-1	10	10	10	10	10	10	10	10
		E-2								
	Styrene-maleic anhydride copolymer	G-1							10	20
	Light discoloration	(ΔYI)	16	16	16	16	16	18	22	23
	Izod impact strength	(kg-cm/cm)	15	25	9	6	4	3	2	2
	Impact brittle break ratio, 23° C. (No. of broken specimens/no. of specimens tested)		0/5	0/5	1/5	4/5	5/5	5/5	5/5	5/5
	Heat distortion temperature (°C.)	4.6 kg	136	136	135	134	135	134	135	135
		18.6 kg	112	111	110	104	105	98	98	97
	Average particle diameter (μm)		1.2	1.6	1.0	1.1	1.2	7.0	15	13
	Surface appearance		o	o	o	o	o	x	x	x
	Volume % of polyamide (B)/(C) weight ratio	(vol %)	47.5	47.5	47.5	47.5	47.5	47.5	47.6	47.6
	η _{sp} /C of polystyrene	(dl/g)	50/50	50/50	50/50	50/50	50/50	50/50	67/33	100/0
			0.82	1.01	0.70	0.61	0.41	0.83	—	—

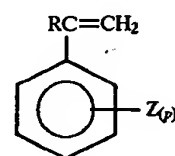
TABLE 4

Example Nos. and Comparative Example Nos.			Ex. 11	Ex. 12	Ex. 13	Ex. 14	Comp. Ex. 12	Comp. Ex. 13
Formulation (part by weight)	Polyamide	A-1						
		A-2	50	50	50	47	47	50
	Polyphenylene ether	B-1						
		B-2	20	25	22	21	38	20
	Polystyrene	C-1	20	25	15	17		
		C-2						
		C-3						
		C-4						
		C-5						
	Maleic anhydride	D-1	0.16	0.16	0.16	0.15	0.15	0.16
Properties	Rubbery polymer	E-1			13			
		E-2	10			5	5	10
	Glass fiber	H-1				10	10	
	Rubber-reinforced polystyrene	I-1						20
	Light discoloration	(ΔYI)	16	15	16	—	—	17
	Izod impact strength	(kg-cm/cm)	18	3	70	10	10	7
	Heat distortion temperature	4.6 kg	135	139	144	204	204	133
	(°C.)	18.6 kg	111	126	106	142	182	109
	Average particle diameter	(μm)	1.0	1.0	1.1	0.9	0.9	1.1
	Surface appearance		o	o	o	o	x	o
	Volume % of polyamide (B)/(C) weight ratio	(vol %)	47.3	46.9	47.3	47.4	47.5	47.3
			50/50	50/50	60/40	55/45	100/0	50/50
	η _{sp} /C of polystyrene	(dl/g)	0.80	0.81	0.82	0.80	—	0.60

What is claimed is:

1. A polyamide resin composition comprising a melt-kneaded product of:

55



(II)

(A) a polyamide comprising at least one polyamide selected from the group consisting of nylon 6, nylon 66, nylon 6T, nylon 6I, nylon 610, nylon 612, a copolymer of these polyamides and a mixture of these polyamides;

(B) a polyphenylene ether;

(C) a styrene polymer comprising at least one styrene polymer obtained by polymerizing at least one styrene compound represented by the following formula

60

65

wherein R represents a hydrogen atom or an alkyl group having 1 to 4 carbon atoms, Z represents a vinyl group, a hydrogen atom, a halogen atom or an alkyl group having 1 to 4 carbon atoms, and p represents an integer of from 0 to 5;

(D) a compound having in a molecule thereof a carbon-to-carbon double bond and at least one functional group selected from the group consisting of a carboxylic acid group, an acid anhydride group, an epoxy group, an amino group and a hydroxyl group,

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